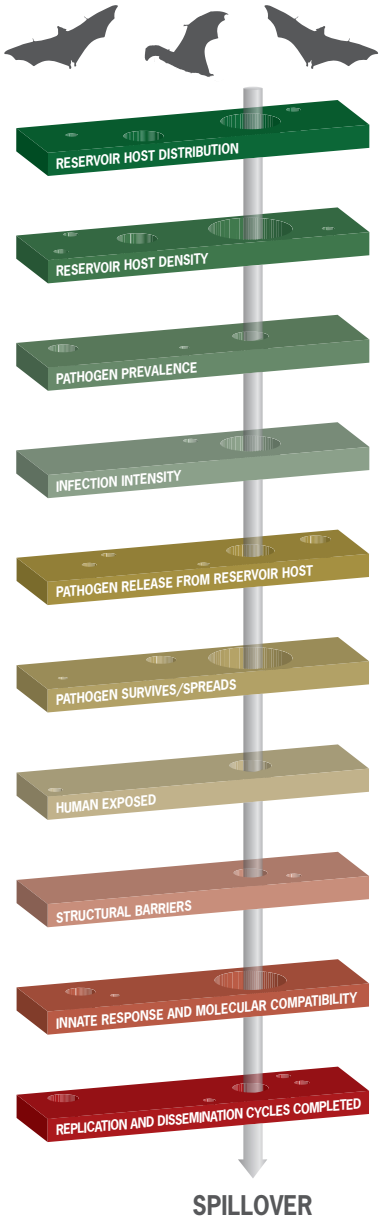

MESO-LARGE SCALE BAT STUDIES

Surveillance of wild bats in 4 countries spanning full range of henipaviruses (HNVs) (11.01, 11.02)

Surveillance of a captive colony of bats infected with HNV (11.01)

Immune & physiological responses of bats (11.04)
- Immunological drivers of shedding pulses

Environmental drivers of shedding pulses (11.10)

QUASISPECIES (QS) COMPATIBILITY IN HUMANS

Viral gene sequences (11.03)

Genotype-to-phenotype (11.13) *in vitro, in vivo*

Models of viral fitness (11.15) *in silico*

HISTORIC DATA/SURVEILLANCE HUMANS AND LIVESTOCK

Viral sequences from humans and livestock (11.12)
- ID QS that successfully breached spillover barriers

EXPERIMENTS IN BATS AND BRIDGE HOSTS

Iterative validation of field and modeling (11.08)

ANALYSIS/OUTPUTS

Machine learning to predict reservoir hosts (11.16)

Models of bat virus dynamics (11.06, 11.09)
- Evolutionary mechanisms
- Mechanisms of shedding pulses
- Optimizing sampling approaches

Remote tools to predict shedding

Longitudinal datasets
- HNV shedding events
- HNV phylodynamics
- Environmental dynamics

Viral fitness of HNV
- Targets for preemption

MULTI-SCALE MODELS OF SPILLOVER

Predict locations and times of spillover and effective points of intervention (12.02)

ACTIONABLE FINDINGS

Bat movement patterns and seasonal habitat requirements (22.03)

Validated link between nutritional stress and viral shedding (11.04)

Real-time detection of shedding pulses for rapid deployment of TA2 interventions

Vaccines for high-risk genotypes

PREEMPTION ACTIONS

Habitat for Health (22.03)
- Strategic habitat restoration and reforestation
- Landscape approach to prevent shedding pulses and minimize bat contact with humans and livestock

Vaccines specific to high-risk HNVs (22.02)
- Spread by allogrooming